

AC Power
For Business-Critical Continuity™

Liebert® PSI XR™

User Manual—1000/1500/2200/3000VA, 50/60Hz, 230VAC



Liebert UPS user manual



Amplicon.co.uk

IT and Instrumentation for industry

Amplicon

Sales: +44 (0) 1273 570 220 Website: www.amplicon.co.uk Email: sales@amplicon.co.uk

(BLANK PAGE)

TABLE OF CONTENTS

1.0	INTRODUCTION	4
2.0	WHAT'S INCLUDED	5
3.0	INSTALLATION	6
3.1	Preparation	6
3.2	Tower UPS Installation	7
3.3	Rack-Mount UPS Conversion and Installation	8
3.4	Orient Display for Installation	9
3.5	Connect Input Power and Load	9
3.6	Connect Network Surge protection	10
3.7	Connect Computer Interface Port	10
3.8	EPO Switch	11
3.9	External Battery Cabinet Installation	11
4.0	CONTROLS AND INDICATORS	13
4.1	Control Buttons	14
4.1.1	On/Alarm Silence/Manual Self-Diagnostic Test	14
4.1.2	Off Button	14
4.2	Status Indicators	14
4.2.1	Status Change Button	14
4.2.2	Load Level Indicator	14
4.2.3	Battery Level Indicator	15
4.2.4	UPS Status Indicators	15
5.0	OPERATIONAL MODES	16
5.1	Normal Mode	16
5.2	Buck/Boost Mode	16
5.3	Battery Mode	16
5.4	Battery Recharge Operation	16
6.0	COMMUNICATION	17
6.1	DB-9 Connector	17
6.2	Remote Shutdown Via the DB-9 Connector	17
6.2.1	Any Mode Shutdown Via Pins 5 & 6	17
6.2.2	Battery Mode Shutdown Via Pins 4 & 5	17
6.3	RJ-45 Data Line Protection Connectors	18
6.4	UPS Communications	18
6.5	UPS Inverter/Transfer Voltage Configurations	18

7.0	BATTERY MAINTENANCE	19
7.1	Battery Charging, Storage	19
7.2	Internal Battery Replacement Procedure	19
8.0	SPECIFICATIONS	20
9.0	TROUBLESHOOTING	23

FIGURES

Figure 1	Front view of UPS	4
Figure 2	1000 and 1500VA—rear view	4
Figure 3	2200 and 3000VA—rear view	4
Figure 4	Accessories	5
Figure 5	Placing the Liebert PSI XR	6
Figure 6	Tower configuration—attach Tower Stand	7
Figure 7	Convert the Liebert PSI XR for rack installation	8
Figure 8	Orienting the UPS display	9
Figure 9	Connect mains power and load	9
Figure 10	Connect network surge protection	10
Figure 11	Connect computer interface port	10
Figure 12	EPO connection for normally open operation	11
Figure 13	Install the external battery cabinet in tower installation	11
Figure 14	Connect battery cabinets to UPS	12
Figure 15	Display and status indicators	13
Figure 16	DIP switch settings for 230V system	18
Figure 17	Battery replacement	19

TABLES

Table 1	Battery cabinet connector color key	12
Table 2	Display and status indicators function, legend	13
Table 3	Status indicators—color, illumination mode	15
Table 4	DB-9 pin assignment	17
Table 5	Voltage configurations	18
Table 6	Liebert PSI XR specifications	20
Table 7	Liebert PSI XR battery cabinet specifications	21
Table 8	Liebert PSI XR battery run times	22
Table 9	Troubleshooting—problems, causes and solutions	23

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

This manual contains important safety instructions that must be followed during the installation and maintenance of the UPS and batteries. Read this manual thoroughly before attempting to install or operate this UPS.

The equipment can be installed and operated by individuals without previous training.



WARNING

Install the UPS indoors in a temperature- and humidity-controlled room, free of conductive contaminants, moisture, flammable liquids, gases and corrosive substances.

Some components are live, even when AC power is disconnected. For service, contact a properly trained and qualified technician. Do not remove the cover; the UPS has no user-serviceable parts inside except the internal battery pack.

Operate the UPS only from a properly grounded (earthed) 220-240 VAC, 50Hz or 60Hz AC supply. Do not supply this UPS from electrical power systems of the IT type (IEC 364 - Electrical Installation of Buildings).



WARNING

Although the UPS has been designed and manufactured to ensure personal safety, improper use can result in electrical shock or fire. To ensure safety, observe the following rules:

- Turn Off and unplug the UPS before cleaning it. Clean the UPS with a dry cloth. Do not use liquid or aerosol cleaners.
- Do not install or operate the UPS in or near water.
- Never block or insert any objects into the ventilation holes or other openings of the UPS. Keep all vents free of dust accumulation that could restrict air flow.
- Do not place UPS power cord anywhere it might be damaged.

Battery Handling Precautions



WARNING

Batteries should be replaced only by properly trained and qualified personnel knowledgeable of batteries and required precautions.

A battery can present a risk of electrical shock and high short-circuit current. The following precautions must be observed when working on batteries:

- Remove watches, rings and other metal objects.
- Use tools with insulated handles.
- Do not dispose battery or batteries in a fire. The battery may explode.
- Do not open or mutilate the battery or batteries. Released electrolyte is toxic. It may cause injury to the skin and eyes.
- When replacing the battery, use the type of battery as is listed in **Tables 6 and 7**.
- Handle, transport and recycle batteries in accordance with local regulations.

CONDITIONS OF USE—The mains supply socket must be within 1.8m (6ft.) of the UPS and be easily accessed.

This UPS provides conditioned power to connected equipment. It is designed for commercial use only. It is not intended for use with life-support and other designated “critical” devices. Maximum load must not exceed that shown on the UPS rating label. If uncertain, consult your local Liebert or Emerson Network Power Liebert Applications.

The Liebert PSI™ XR 1000 and 1500 models are not supplied with an input power cable for connection to the mains supply socket. Use the input mains supply power cable from your data processing equipment to connect the UPS to the mains supply.

For the Liebert PSI XR 2200 and 3000 models, use the supplied 16A-rated input mains supply cables. For UK supply systems, consult a properly trained and qualified electrician to connect the lead supplied for the 2200 and 3000 models to the mains supply.

The UPS and connected load total earth leakage current must not exceed 3.5mA. If the connected load earth leakage current is likely to exceed 2.5mA or if you are unsure, then convert the input cable attachment to either a fixed wiring installation or an industrial plug/socket (e.g., CEE 17 connector).

This alteration should be carried out by a properly trained and qualified electrical engineer who is conversant with local electrical codes and regulations.

When installing the UPS or making input and output connections, comply with all relevant safety codes and standards (e.g. IEC60950, VDE0805, EN62040-1).

Placing magnetic storage media on top of the UPS may result in data corruption.

ELECTROMAGNETIC COMPATIBILITY—The Liebert PSI XR series complies with the requirements of EMC Directive 89/336/EEC and the published technical standards. Continued compliance requires installation in accordance with these instructions and use of Emerson Network Power-approved accessories only.

When using the communication features on this UPS, ensure the cabling connected to the DB-9 or UPS communications ports are kept separated from the power leads to the UPS input and output.

NOTICE

Do not connect equipment that could overload the UPS or demand half-wave rectification from the UPS, for example: electric drills, vacuum cleaners, laserjet/inkjet printers, hair dryers, overhead projectors.

GLOSSARY OF SYMBOLS



Risk of electrical shock



Indicates caution followed by important instructions



Indicates the unit contains a valve-regulated, lead-acid battery



Recycle



DC voltage



Equipment grounding conductor



Bonded to ground



AC voltage



ON/Alarm Silence/Manual Self-Diagnostic Test



OFF



Status Change Button

1.0 INTRODUCTION

The Liebert PSI™ XR is a 2U, line-interactive UPS that may be installed in a rack or used as a tower UPS.

Status indicators on the front of the Liebert PSI XR display load level, battery level, buck/boost, site-wiring fault and battery status. Controls include a combination ON/ Alarm Silence/Manual Self-Diagnostic button, an Off button and a Display Status Change button.

The Liebert PSI XR has USB, DB-9 (RS-232/contact closure) and SNMP interface ports. The DB-9 and USB ports provide detailed operating information including voltages, currents, and alarm status to the host system when used in conjunction with Liebert shutdown software.

Figure 1 Front view of UPS

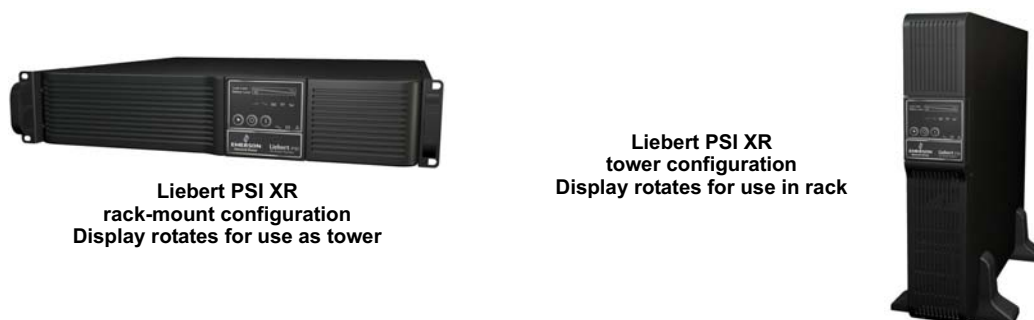


Figure 2 1000 and 1500VA—rear view

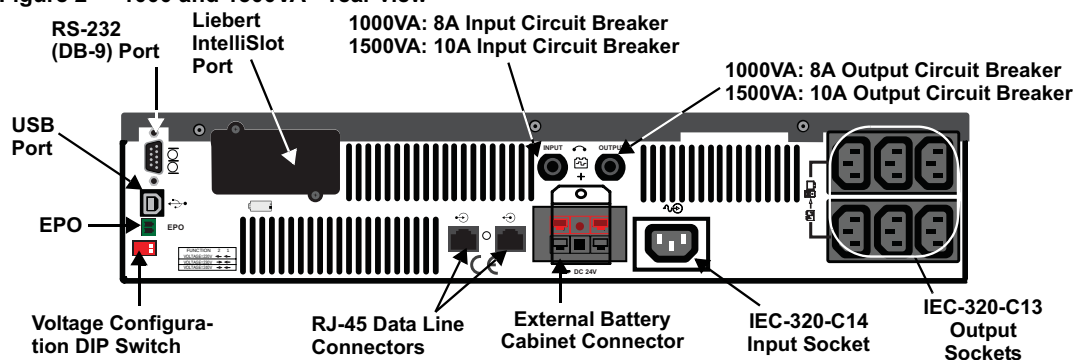
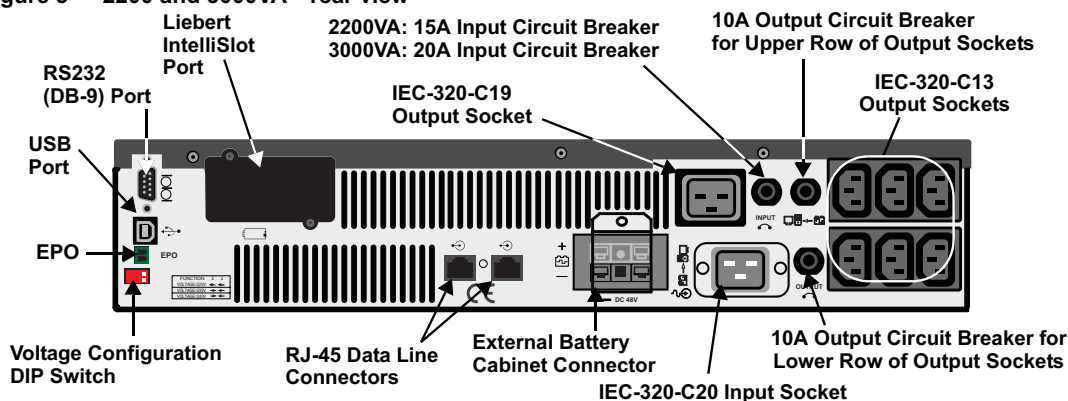


Figure 3 2200 and 3000VA—rear view

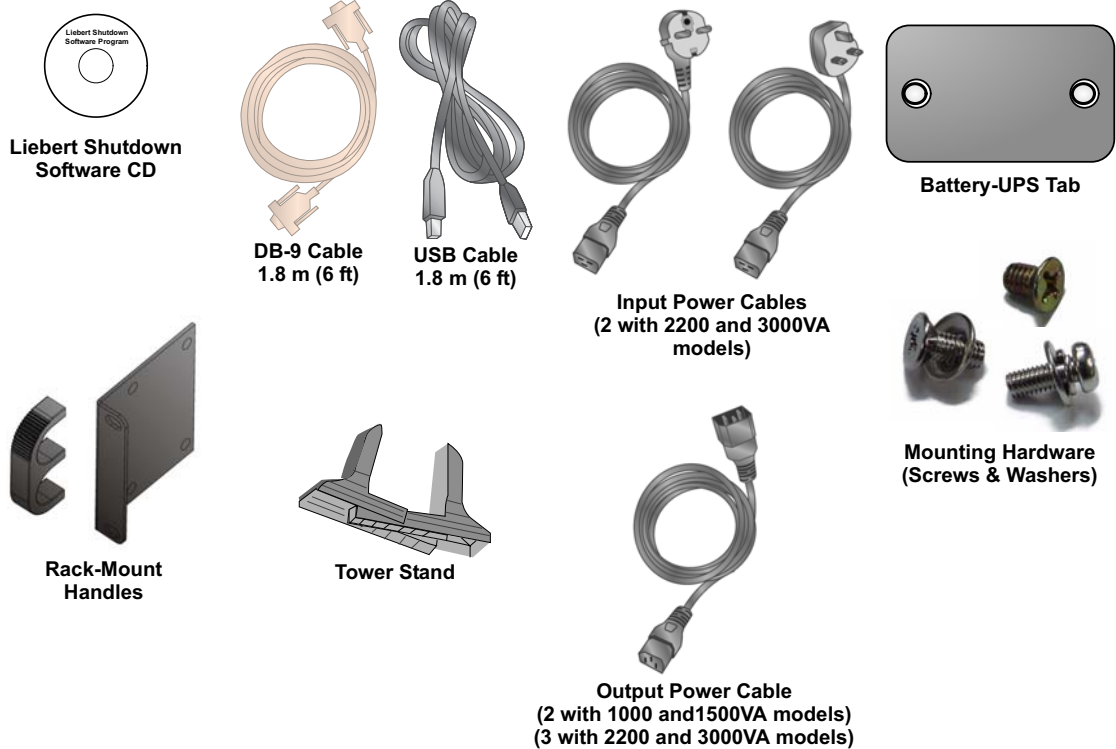


2.0 WHAT'S INCLUDED

The Liebert PSI XR is shipped with the following items:

- Multi-Language User Manual on CD
- Liebert Shutdown Software and User Manual on CD
- DB-9 Serial Cable
- USB Cable
- Input Power Cord, 2200/3000 only: 2
- IEC Output Cable, 1000/1500 only: 2
- IEC Output Cable, 2200/3000 only: 3
- Tower Stand
- Rack-Mount Handles
- Battery-UPS Tab

Figure 4 Accessories



3.0 INSTALLATION

3.1 Preparation

Inspect the UPS for freight damage. Report any damage to the carrier and your local dealer or Emerson representative.



CAUTION

Risk of injury from heavy unit. May cause equipment damage or personal injury.

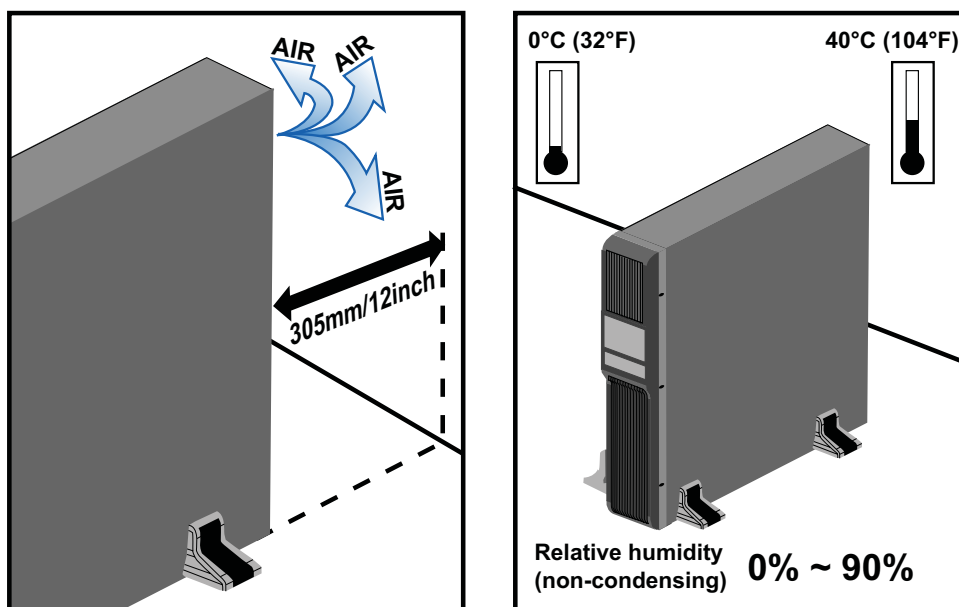
The UPS and battery cabinets are heavy (see **Table 6** and **Table 7**). Take proper precautions when lifting or moving either the UPS or battery cabinets.

The Liebert PSI XR may be installed in either a tower or rack configuration. Determine the method that suits the application and proceed.

Decide where to install the Liebert PSI XR. The UPS must be installed indoors in a controlled environment. Place it in an area with unrestricted airflow around the unit, away from water, flammable liquids, gases, corrosives and conductive contaminants (see **Figure 5**).

Maintain a minimum clearance of 305mm (12 inches) in the front and rear of the UPS. Maintain an ambient temperature range of 0°C to 40°C (32°F to 104°F) (see **Figure 5**).

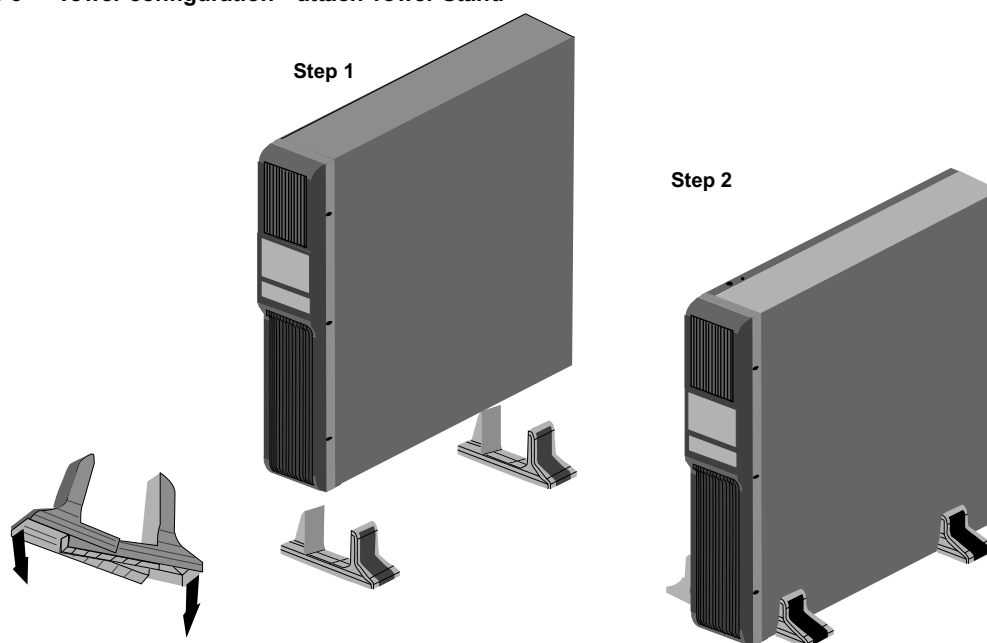
Figure 5 Placing the Liebert PSI XR



3.2 Tower UPS Installation

See **Figure 6** when using the Liebert PSI XR in a tower configuration.

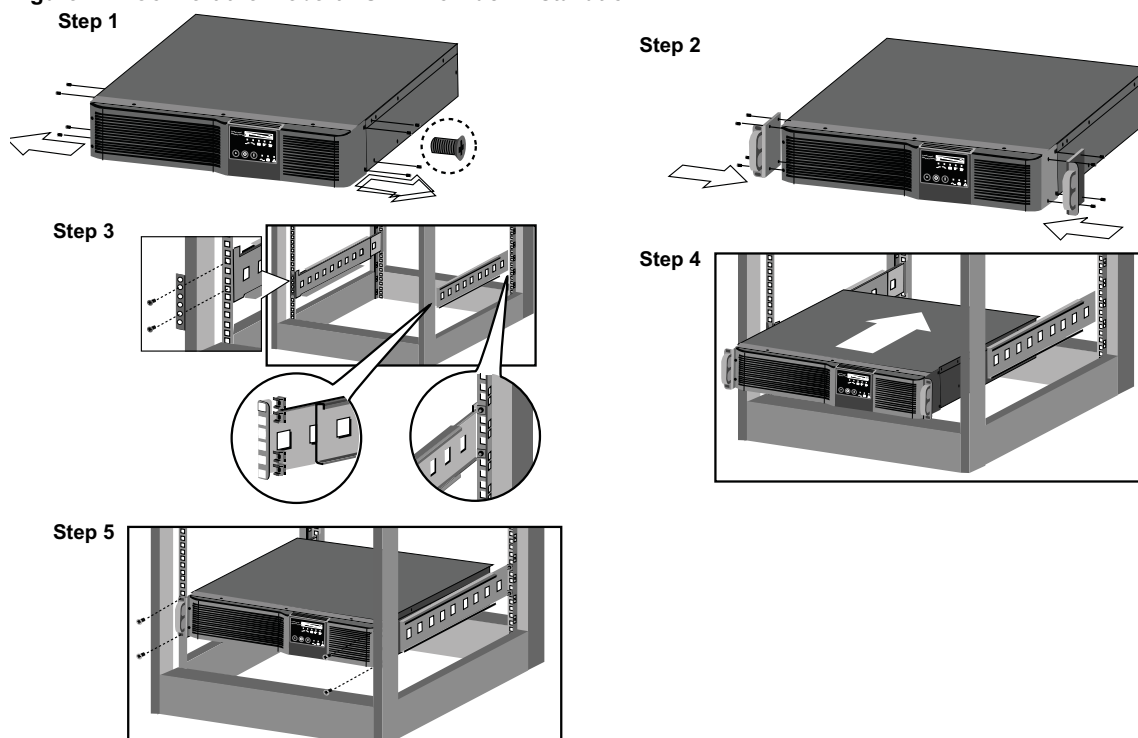
Figure 6 Tower configuration—attach Tower Stand



3.3 Rack-Mount UPS Conversion and Installation

See **Figure 7** when installing the Liebert PSI XR in a rack. External battery cabinets are installed in racks in the same manner.

Figure 7 Convert the Liebert PSI XR for rack installation



WARNING

Risk of top-heavy unit falling over. May cause equipment damage, personal injury or death.

Placing heavy equipment near the top of a rack may increase the risk of tipping. Place the UPS or battery cabinet, if one is being used, in the bottom of the rack.



CAUTION

Risk of strain from lifting heavy equipment. May cause personal injury.

Lifting equipment into rack may be a two-person job, depending on weight of equipment.

NOTICE

When rack-mounted, the UPS must be supported by a shelf, slide rails, brackets or fixed rails on each side. The rack mount handles **WILL NOT** support the weight of the UPS. They are used to move the UPS into and out of the rack.

3.4 Orient Display for Installation

The Liebert PSI XR features a rotating display that may be oriented for either tower or rack installations.

To set the display for your installation, pull out on the display and rotate it until it is oriented correctly, then press it into the UPS until it is seated.

Figure 8 Orienting the UPS display

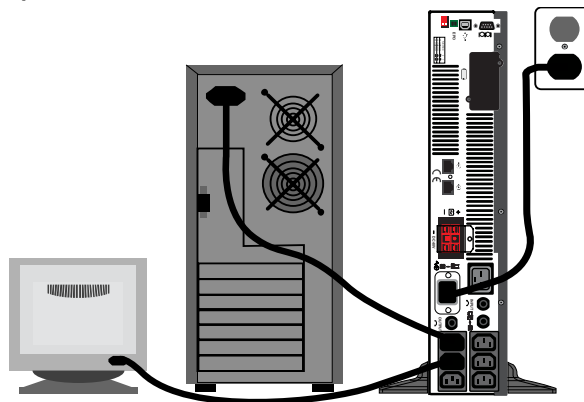


3.5 Connect Input Power and Load

The 1000VA and 1500VA models do not include an input power cable; the 2200VA and 3000VA UPSs include an input power cable.

Connect input power to the UPS, then plug the equipment into the sockets on the rear of the UPS. These UPS sockets provide battery backup and surge protection to the equipment when mains power fails, spikes or sags (see **Figure 9**).

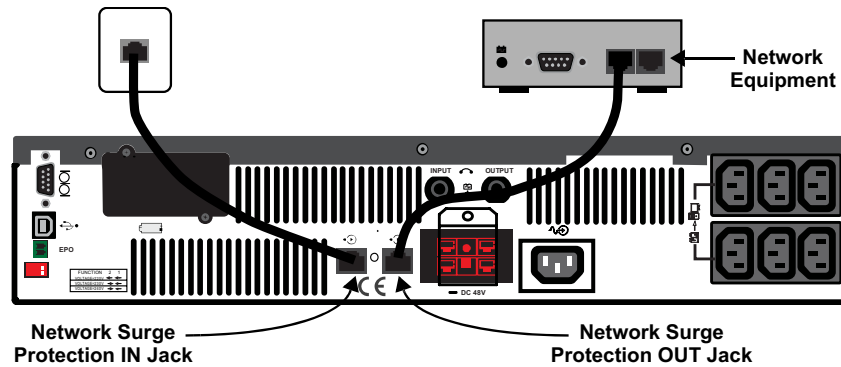
Figure 9 Connect mains power and load



3.6 Connect Network Surge protection

Connect a 10 base-T/100 network cable to the RJ-45 network surge protection IN jack on the rear of the UPS. Connect from the OUT jack with network cabling to network equipment (see **Figure 10**).

Figure 10 Connect network surge protection



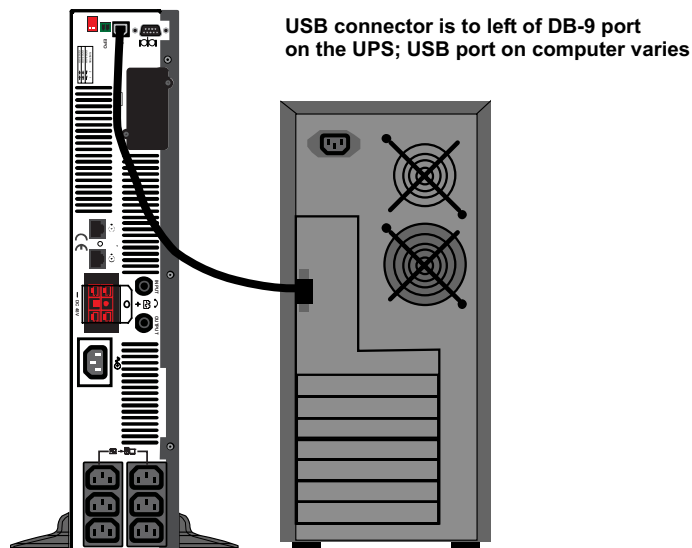
3.7 Connect Computer Interface Port

Determine what type of communication connection to use to manage the UPS. The Liebert PSI XR can be monitored with any of these communication methods:

- serial
- contact closure
- USB
- SNMP

See the Liebert shutdown software installation guide on the included CD-ROM for details and installation information. Also refer to **6.4 - UPS Communications**.

Figure 11 Connect computer interface port



3.8 EPO Switch

The Liebert PSI XR is equipped with an Emergency Power Off (EPO) switch. The user must supply a means of interfacing with the EPO circuit to allow disconnecting the UPS input feeder breaker to interrupt all sources of power to the UPS and connected equipment to comply with national and local wiring codes and regulations.

Figure 12 EPO connection for normally open operation

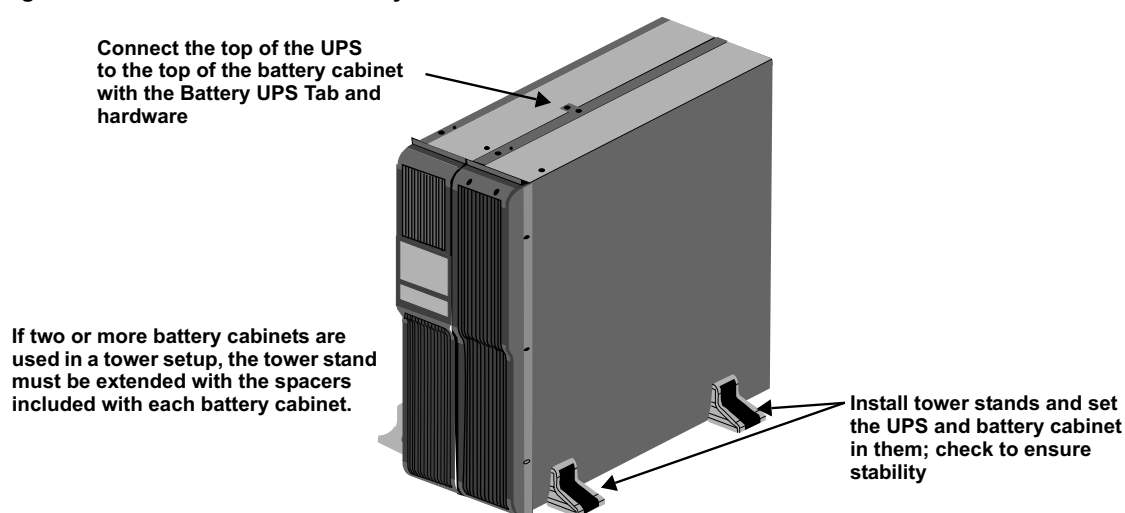


3.9 External Battery Cabinet Installation

Optional Liebert external battery cabinets may be connected to the UPS to provide additional battery run time. External battery cabinets are designed to be placed all on one side of the UPS or stacked beneath the UPS. The batteries have a maximum run time of three hours at full load.

1. Shut down any connected equipment and turn Off the UPS.
2. Install the external battery cabinet in a tower configuration or in a rack (see **Figure 13** or **3.3 - Rack-Mount UPS Conversion and Installation**).
3. Connect the external battery cabinet cable to the rear of the external battery cabinet, then to the rear of the UPS (see **Figure 14**).

Figure 13 Install the external battery cabinet in tower installation



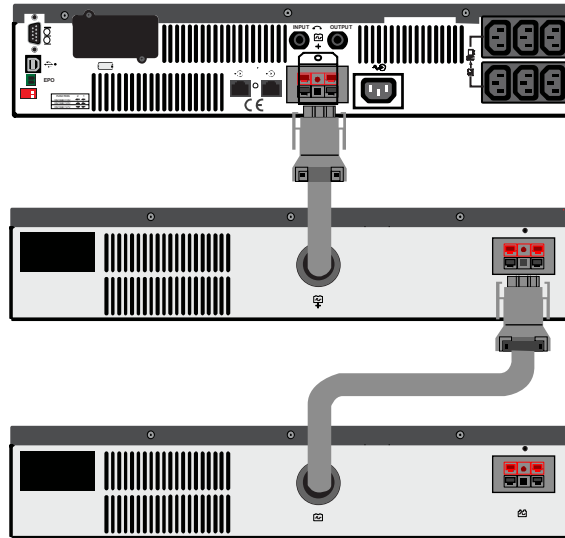
NOTICE

External battery cabinet connectors are color-coded as noted in **Table 1**. Do not try to install external battery cabinets with connectors that are a different color from the battery connector on the UPS.

Table 1 Battery cabinet connector color key

UPS Model	Nominal System Voltage (connector color)	External Battery Cabinet Model
PS1000RT3-230XR	24VDC (Red)	PSRT3-24VBXR
PS1500RT3-230XR		
PS2200RT3-230XR	48VDC (Gray)	PSRT3-48VBXR
PS3000RT3-230XR		

Figure 14 Connect battery cabinets to UPS



See **Table 8** for approximate battery run times.

4.0 CONTROLS AND INDICATORS

Buttons on the front panel display control the Liebert PSI XR. Eight LEDs on the panel indicate the UPS's status. Refer to **Figure 15** and **Table 2**.

Figure 15 Display and status indicators

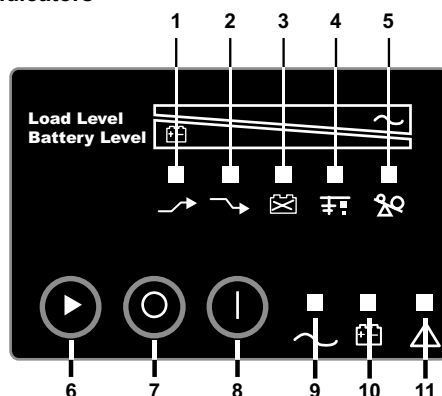


Table 2 Display and status indicators function, legend

Item	Name	Status Indicators	Description
1	LED 1	AVR Boost	UPS Operation in AVR Boost Mode
2	LED 2	AVR Buck	UPS Operation in AVR Buck Mode
3	LED 3	Battery Condition	Battery Fault/Weak
4	LED 4	Grounding/Site Wiring Fault	UPS Grounding/Site Wiring Fault
5	LED 5	Overload	UPS Overload
1 to 5	Load/Battery Level		Indicate Load/Battery Level
6	Status Change Button		Switches Display from Load Level Indicators to Battery Level Indicators
7	OFF Button		UPS Off
8	ON Button		Turn on UPS, Manual Self-Diagnostic (Normal Mode), Silence Alarm (Battery Mode)
9	LED 9	Normal Mode	UPS Operation in Normal Mode
10	LED 10	Battery Mode	UPS Operation in Battery Mode
11	LED 11	UPS Fault	UPS Fault

4.1 Control Buttons

4.1.1 On/Alarm Silence/Manual Self-Diagnostic Test

This button controls output power to connected load(s). It has three functions:

- On
- Alarm Silence
- Manual Self-Diagnostic Test

ON—Start the UPS by pressing this button for more than 3 seconds, then releasing the button (an alarm will sound briefly). If the ON button is pressed and mains is outside input parameters, the UPS will start on battery (dark start).

Alarm Silence—Silence a Battery Mode audible alarm by pressing this button for longer than one second, then releasing it.

Manual Self-Diagnostic Test—To initiate a Manual Self-Diagnostic, press this button for at least three (3) seconds while operating from the mains. UPS will switch to Battery Mode to detect battery voltage and whether the UPS is operating normally.

If LED indicates the battery is weak: Allow the UPS to recharge the batteries for 8 hours. Retest the battery after recharge.

If LED still indicates that the battery is weak after the battery has been retested, contact your local dealer, local Emerson representative or Liebert Applications.

If LED indicates a Battery Fault: Contact your local dealer, Emerson representative or Liebert Applications.

If LED indicates a UPS Fault: Remove the load, retest the self-diagnostic test, if LED indicated UPS Fault, Contact your local dealer, Emerson representative or Liebert Applications.



NOTE

Refer to **Figure 15** and **Table 2** for details about the LEDs' meaning.

4.1.2 Off Button

When the UPS is operating in either Normal Mode or Battery Mode, pressing the Off button for more than three seconds will shut down the UPS.

4.2 Status Indicators

4.2.1 Status Change Button

The Status Change Button determines the information displayed by the five LEDs on the front panel. The default information shown by the LEDs is the load level on the UPS. Pressing the Status Change Button while the UPS is On prompts the LED display to show battery capacity for 5 seconds. This function assists in assessing the meaning of status indicators as described in **4.2.4 - UPS Status Indicators**. See **Figure 15** and **Table 2** for the Status Change Button's location.

4.2.2 Load Level Indicator

The five LEDs at the top of the front panel illuminate with a steady glow to indicate the load level on the output of the UPS. The LEDs show the load level as a range, $\pm 5\%$. The LEDs' load level meanings and colors are:

LED 1	LED 2	LED 3	LED 4	LED 5
10-24% — Green	25-49% — Green	50-74% — Yellow	75-99% — Yellow	100% or greater — Red

4.2.3 Battery Level Indicator

The five LEDs illuminate with a steady glow to indicate battery capacity. Battery capacity is shown for five seconds after the Status Change Button is pressed. The LEDs show the battery capacity as a range, $\pm 5\%$. The LEDs' battery level meanings and colors are:

LED 1	LED 2	LED 3	LED 4	LED 5
100 - 76% — Green	75 - 51% — Green	50 - 26% — Yellow	25 - 11% — Yellow	10% or less — Red

4.2.4 UPS Status Indicators

LEDs on the display panel illuminate with a steady glow or flash to indicate the UPS's status:

Mains Mode—The Mains Mode indicator illuminates (LED 9) with a steady glow when mains power is available and within the input specifications.

Battery Mode—The Battery Indicator illuminates (LED 10) with a steady glow when the UPS is operating on battery.

AVR Boost, AVR Buck—When the UPS is in AVR Boost/Buck Mode, the LED display will indicate the relative load level on the output of the UPS and will flash LED 1 (boost) or LED 2 (buck) to indicate the mode.

Weak Battery—When the UPS battery voltage is low, the LED display will indicate the relative load level on the output of the UPS and LED 3 will flash as a warning.

Site-Wiring Fault—In case of a site-wiring fault, the LED display will indicate the relative load level on the output of the UPS and LED 4 will flash as a warning.

Overload—When UPS operates in overload status, the LED display will indicate the relative load level on the output of the UPS and LED 5 will flash as a warning.

Table 3 Status indicators—color, illumination mode

Status	LED 1	LED 2	LED 3	LED 4	LED 5	LED 9	LED 10	LED 11
Normal Mode						Green Steady		
AVR Boost	Green Flashes					Green Steady		
AVR Buck		Green Flashes				Green Steady		
Battery Mode (dark start)							Yellow Steady	
Weak Battery			Yellow Flashes					
Site-Wiring Fault				Yellow Flashes				
Overload					Red Flashes			
Battery Fault Shutdown			Yellow Steady					Red Steady
Overload Shutdown					Red Steady			Red Steady
UPS Output Abnormal Shutdown							Yellow Steady	Red Steady

5.0 OPERATIONAL MODES

5.1 Normal Mode

When the UPS is in Normal Mode, the Normal Mode Indicator illuminates green.

5.2 Buck/Boost Mode

The Automatic Voltage Regulator (AVR) circuitry compensates for fluctuations in mains power, such as voltage surges and sags. The Liebert PSI XR compensates for these by raising the undervoltage (boost) or lowering the overvoltage (buck). The AVR operates automatically and maintains the output voltage to the connected equipment without utilizing the batteries.

5.3 Battery Mode

The UPS switches to Battery Mode in the event of an extreme input voltage/frequency condition or mains failure.

When the UPS is in Battery Mode, the Battery Indicator illuminates amber and an alarm sounds at 2-second intervals. As capacity decreases, fewer indicators remain illuminated.

When a Low Battery condition occurs, the Battery Indicator flashes amber and an alarm sounds at one-second intervals. For approximate battery run times, refer to **Table 8**.

5.4 Battery Recharge Operation

Once mains power is restored, the UPS resumes normal operation, and the Battery Charger begins recharging the batteries.

6.0 COMMUNICATION

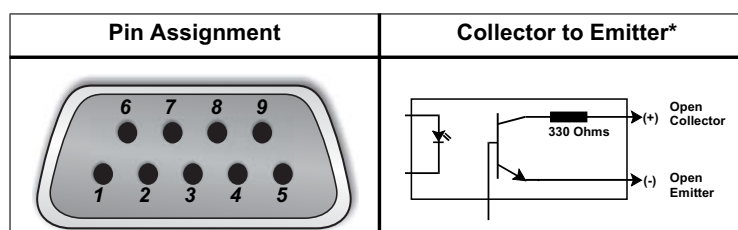
6.1 DB-9 Connector

The UPS has a DB-9 (9 pin female) connector on the rear to allow UPS status communications with a computer running Liebert shutdown software. The connection provides serial communication, On Battery and Low Battery signals. Liebert shutdown software and a 1.8m (6 ft.) DB-9 serial cable are shipped with the UPS.

When power is interrupted and battery power is low, Liebert shutdown software can signal the host computer to gracefully shut down the operating system.

Table 4 DB-9 pin assignment

DB-9 Pin	Assignment Description
1	Low Battery (open collector)
2	UPS TxD
3	UPS RxD
4	Remote Shutdown (5-12V); on-battery operation
5	Common
6	Output Off, (short to Pin 5, non-latching); any mode operation
7	Low Battery (open emitter)
8	Mains Fail (open emitter)
9	Mains Fail (open collector)



6.2 Remote Shutdown Via the DB-9 Connector

The Liebert PSI XR can be shut down remotely by shorting Pins 5 and 6 or via Pins 4 and 5 of the DB-9 connector.

6.2.1 Any Mode Shutdown Via Pins 5 & 6

When Pin 6 is shorted to Pin 5, the UPS output is shut Off no matter what mode the UPS is operating. The UPS cannot be started as long as the pins are shorted. When the short is removed, the UPS output can be enabled by pressing the ON/Alarm Silence/Manual Self-Diagnostic Test button.

6.2.2 Battery Mode Shutdown Via Pins 4 & 5

While the UPS is operating on battery, a 5-12VDC signal for 2 seconds or longer is required to signal a shutdown. Signals for less than 2 seconds are ignored.

After Pin 4 receives the shutdown signal, a 2-minute shutdown timer begins a countdown. The shutdown timer cannot be stopped: If mains power returns during the 2-minute countdown, the shutdown timer continues until the end of 2 minutes and the UPS turns Off. The UPS will restart 10 seconds after mains power returns.

6.3 RJ-45 Data Line Protection Connectors

Data line (in and out) connectors on the rear of the UPS provide transient voltage surge suppression (TVSS) for network devices.

6.4 UPS Communications

The Liebert PSI XR is equipped with a Liebert IntelliSlot® port to provide advanced communication and monitoring options.

Liebert's shutdown software continually monitors the UPS and can shut down your computer or server via USB and RS-232 in the event of an extended power failure.

The Liebert IS-WEBRT3 provides SNMP and Web-based monitoring and control of the UPS across the network.



NOTE

The USB and Contact Closure communications operate in parallel. Using the Liebert IS-WEBRT3 disables the serial communications of the DB-9.

6.5 UPS Inverter/Transfer Voltage Configurations

A two-pin DIP switch on the rear of the Liebert PSI XR permits setting the UPS to operate at nominal voltages of 220V, 230V or 240V. This feature will change the high and low points at which the UPS switches to battery power. It also will change the UPS' output voltage when the UPS is operating in battery mode. The factory default setting is 230 VAC.

Figure 16 DIP switch settings for 230V system

FUNCTION	1	2
Voltage = 220V	↑	↓
Voltage = 230V	↓	↓
Voltage = 230V	↑	↑
Voltage = 240V	↓	↑

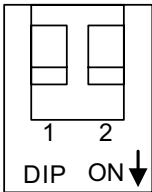


Table 5 Voltage configurations

Setting	Input Voltage Range	Output Voltage (Battery Mode)
220	165~275	220VAC
230	173~288	230VAC
240	180~300	240VAC

7.0 BATTERY MAINTENANCE

7.1 Battery Charging, Storage

The batteries are valve-regulated, nonspillable, lead acid and must be kept charged to retain their design life. The Liebert PSI XR continuously charges the batteries when connected to the mains supply, even while the UPS is switched Off.

If the Liebert PSI XR will be stored for an extended period, Liebert recommends connecting the UPS to input power for at least 8 hours every four to six months to keep the batteries charged.

7.2 Internal Battery Replacement Procedure

NOTICE

This UPS is equipped with internal batteries that the user can replace without shutting down the UPS or connected loads (hot swappable). Caution must be exercised when replacing the batteries because the load is unprotected from power fluctuations and power failures.

To replace the batteries:

1. Remove the two screws on the left side of the front bezel.
2. Pull the front bezel off the UPS.
3. Remove the two screws on the battery bracket.
4. Remove the screw on the battery connectors holder.
5. Disconnect the two slotted red/gray and black battery connectors.
6. Grasp the battery pack assembly by the handle and pull it out of the front of the UPS.
7. Unpack the new battery assembly, taking care not to destroy the packing.
8. Compare the new and old battery assemblies to make sure they are the same. If so, proceed with replacement. If they are different, STOP and contact your local dealer, Emerson representative or Liebert Applications.
9. Slide the new battery pack into the UPS.
10. Reattach the battery bracket with the two screws.
11. Reconnect the slotted red/gray and black battery connectors.
12. Reinsert the screw on the battery connectors holder.
13. Reattach the front bezel.

Figure 17 Battery replacement

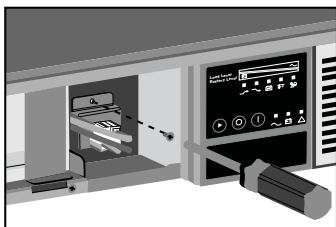
Step 1



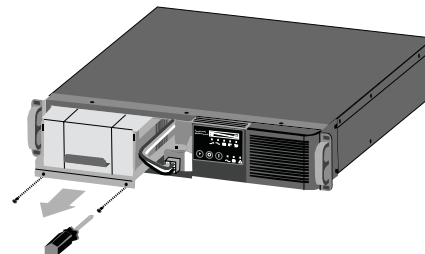
Step 2



Step 4



Step 6



8.0 SPECIFICATIONS

Table 6 Liebert PSI XR specifications

Model Number	PS1000RT3-230XR	PS1500RT3-230XR	PS2200RT3-230XR	PS3000RT3-230XR
Power Rating, VA/W	1000VA/900W	1500VA/1350W	2200VA/1980W	3000VA/2700W
Dimensions, W x D x H, mm (in)				
Unit	440 x 490.5 x 88 (17.3 x 19.3 x 3.5)	440 x 490.5 x 88 (17.3 x 19.3 x 3.5)	440 x 700.5 x 88 (17.3 x 27.6 x 3.5)	440 x 700.5 x 88 (17.3 x 27.6 x 3.5)
Shipping	560 x 612 x 228 (22 x 24.1 x 9)	560 x 612 x 228 (22 x 24.1 x 9)	560 x 821 x 228 (22 x 32.3 x 9)	560 x 821 x 228 (22 x 32.3 x 9)
Weight, kg (lb)				
Unit	25 (55)	28 (61)	42 (93)	46 (102)
Shipping	29 (64)	32 (70)	47 (104)	51 (111)
Input AC Parameters				
Surge Protection	220J			
Voltage Range Without Battery Operation	165 to 300 VAC (configurable)			
Frequency Range	45~65Hz, (±0.5Hz)			
Input Socket	IEC-320-C14	IEC-320-C14	IEC-320-C20	IEC-320-C20
Output Sockets	(6) IEC-320-C13	(6) IEC-320-C13	(6) IEC-320-C13 (1) IEC-320-C19	(6) IEC-320-C13 (1) IEC-320-C19
Voltage (Normal Mode)	220/230/240 VAC (configurable)			
Voltage (Battery Mode)	220/230/240 VAC (configurable); ±5% before low-battery warning			
Transfer Time	4-6 ms typical			
On-Battery Waveform	Sinewave			
Overload Warning	>100%			
Overload Shutdown (Normal Mode)	>120%, shutdown after one cycle (normal mode).			
Overload Shutdown (Battery Mode)	>130%, shutdown after one cycle (normal mode).			
Battery Parameters				
Type	Valve-regulated, nonspillable, lead acid			
Quantity x Voltage x Rating	4 x 12 x 7.2	4 x 12 x 9	8 x 12 x 7.2	8 x 12 x 9
Recharge Time	5 hours to 90% of rated capacity, after full discharge into resistive load			
Battery Backup Time				
Full Load	5 min.			
Half Load	10 min.			
Environmental				
Operating Temperature, °C (°F)	0 to 40 (32 to 104)			
Storage Temperature, °C (°F)	-15 to 40 (5 to 104)			
Relative Humidity	0% to 90%, non-condensing			
Operating Altitude	Up to 3000m (10,000 ft) at 35°C (95°F) without derating			
Audible Noise	<40 dBA, internal fan(s) Off; <45 dBA, internal fan(s) On			
Agency				
Safety	IEC62040-1-1			
EMC	IEC/EN/AS 62040-2 2nd Ed Class A			
Transportation	ISTA Procedure 1A Certification			

Battery backup times are approximate and may vary depending on the load and battery charge.

Table 7 Liebert PSI XR battery cabinet specifications

Model Number	PSRT3-24VBXR	PSRT3-48VBXR
Used w/UPS Model	PS1000RT3-230XR PS1500RT3-230XR	PS2200RT3-230XR PS3000RT3-230XR
Dimensions, W x D x H, mm (in)		
Unit	440 x 490.5 x 88 (17.3 x 19.3 x 3.5)	
Shipping	560 x 675 x 228 (22 x 26.6 x 9)	
Weight, kg (lb)		
Unit	29 (64)	
Shipping	33 (73)	
Batteries		
Type	Valve-regulated, nonspillable, lead acid	
Quantity x Voltage x Rating	8 x 12 x 7.2	8 x 12 x 7.2
Battery Manufacturers	CSB, YUASA or Equivalent	
Environmental		
Operating Temperature, °C (°F)	0 to 40 (32 to 104)	
Storage Temperature, °C (°F)	-15 to 40 (5 to 104)	
Relative Humidity	0% to 90%, non-condensing	
Maximum Operating Altitude	3000m (10,000 ft.) at 35°C (95°F) without derating	
Agency		
Safety	IEC/EN/AS 62040-1-1	
Emissions	IEC/EN/AS 62040-2 2nd Ed Class A	
Transportation	ISTA Procedure 1A Certification	

Table 8 Liebert PSI XR battery run times

Number of Batteries	Load %	1000VA	1500VA	2200VA	3000VA
Internal Battery	10	82	81	76	75
	25	43	32	32	32
	50	15	13	14	13
	75	9	8	8	8
	100	6	5	5	5
Internal Battery + 1 External Battery Cabinets	10	272	222	161	142
	25	139	109	80	70
	50	73	55	45	31
	75	51	31	25	17
	100	31	18	15	12
Internal Battery + 2 External Battery Cabinets	10	438	357	241	205
	25	231	175	128	106
	50	129	95	67	56
	75	84	61	47	31
	100	65	46	29	18
Internal Battery + 3 External Battery Cabinets	10	614	492	322	267
	25	324	241	170	139
	50	181	131	95	73
	75	126	84	62	50
	100	96	64	48	31
Internal Battery + 4 External Battery Cabinets	10	789	627	483	329
	25	385	308	255	171
	50	233	167	143	95
	75	162	114	100	62
	100	124	82	72	47
Internal Battery + 5 External Battery Cabinets	10	964	762	564	392
	25	509	374	298	204
	50	285	203	167	113
	75	197	139	116	74
	100	151	106	84	56
Internal Battery + 6 External Battery Cabinets	10	1140	897	644	454
	25	601	440	341	236
	50	336	239	191	131
	75	233	163	133	85
	100	179	124	102	65

Run times are in minutes, assume fully charged batteries and are typical at 77°F (25°C) with resistive loads.

9.0 TROUBLESHOOTING

The information below indicates various symptoms a user may encounter in the event the Liebert PSI XR experiences a problem. See **Table 9** for suggested solutions.

1. An alarm sounds, alerting that the UPS requires attention. The alarm can be silenced except for low battery and overload warnings.
2. One or more additional indicators will be illuminated to provide a diagnostic aid to the operator, as described below:

If the UPS fails to operate properly, turn Off the unit and repeat the steps in **3.0 - Installation**. If the problem persists, refer to **Table 9**.

Table 9 Troubleshooting—problems, causes and solutions

Problem	Cause	Solution
UPS will not start	Short circuit	Check the circuit breaker on the rear of the UPS. If it is tripped, reset it and restart the UPS. For help, contact your local dealer, Emerson representative or Liebert Applications.
	Battery is disconnected or completely discharged	Check for proper connection of battery or batteries.
UPS starts on battery, but will not switch to AC (dark start)	UPS not plugged in	Plug in the power cord securely.
	Circuit breaker tripped	Reset the circuit breaker.
	AC overvoltage	Wait until voltage drops to an appropriate level or have the utility power checked by a properly trained and qualified electrician.
UPS shuts down	Short circuit or UPS output is abnormal; LED 10 and LED 11 illuminate and sound audible alarm	Remove the load and turn on the UPS again. For help, contact your local dealer, Emerson representative or Liebert Applications.
	Overload; LED 5 and LED 11 illuminate and sound audible alarm	Check load level display and remove nonessential loads. Recalculate the load and reduce equipment connected to UPS - the total wattage must not exceed the capacity of the UPS.
	LED 3 and LED 11 illuminate and sound audible alarm	Recharge the battery for 8 hours, then turn ON the UPS.
	Liebert shutdown software	Consult the Liebert shutdown software user manual or contact your LAN administrator.
Battery Weak LED (LED 3) flashing	Batteries weak	Recharge batteries.
	Batteries need to be replaced	Replace batteries.

Notes

(BLANK PAGE)

(BLANK PAGE)

Ensuring The High Availability Of Mission-Critical Data And Applications.

Emerson Network Power, the global leader in enabling business-critical continuity, ensures network resiliency and adaptability through a family of technologies—including Liebert power and cooling technologies—that protect and support business-critical systems. Liebert solutions employ an adaptive architecture that responds to changes in criticality, density and capacity. Enterprises benefit from greater IT system availability, operational flexibility and reduced capital equipment and operating costs.

While every precaution has been taken to ensure the accuracy and completeness of this literature, Liebert Corporation assumes no responsibility and disclaims all liability for damages resulting from use of this information or for any errors or omissions.

© 2008 Liebert Corporation

All rights reserved throughout the world. Specifications subject to change without notice.

® Liebert is a registered trademark of Liebert Corporation.

All names referred to are trademarks or registered trademarks of their respective owners.

SLI-23315_REV0_04-08

Emerson Network Power.

The global leader in enabling *Business-Critical Continuity*.

■ AC Power

■ Connectivity

■ DC Power

■ Embedded Computing

■ Embedded Power

■ Monitoring

■ Outside Plant

■ Power Switching & Controls

■ Precision Cooling

EmersonNetworkPower.com

■ Racks & Integrated Cabinets

■ Services

■ Surge Protection

Business-Critical Continuity, Emerson Network Power and the Emerson Network Power logo are trademarks and service marks of Emerson Electric Co.

©2008 Emerson Electric Co.